

Intra-Arterial tPA Treatment for Basilar Artery Thrombosis in the Combat Zone: An Example of Modern Nontrauma Medical Care in War

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ABSTRACT Military physicians deploy primarily to care for traumatic injuries. However, critically ill medical patients are also evaluated and treated in theater with similar capability as hospitals in the United States because of the close proximity of medical and surgical specialists and advanced equipment in combat support and theater hospitals. We report a case of a 33-year-old soldier diagnosed with a basilar infarct, treated with fibrinolytics, and reversal of severe neurological deficits while treated in the U.S. operational Afghanistan Theater.

We report a case of a U.S. soldier who developed an acute basilar artery occlusion (BAO) in Operation Enduring Freedom in Afghanistan. He was successfully treated with intra-arterial tissue plasminogen activator (IA-tPA) at Craig Joint Theater Hospital in Bagram, Afghanistan. This is the first reported case performed in the combat theater. Its successful use demonstrates the advanced evacuation system and medical expertise in modern battlefield medicine. A 33-year-old soldier developed acute dizziness and diplopia during a mission in the Afghan countryside. He was urgently evacuated by helicopter to a forward surgical team; however, computed tomography (CT) was not available. Because of a concern for a brainstem syndrome, he was evacuated to Craig Joint Theater Hospital for CT scan, neurology, and neurosurgical care. Four hours after symptom onset, his exam demonstrated left facial weakness, right sensory deficits, and a "one-and-one-half syndrome" on eye movement exam, localizing the lesion to the left caudal pontine tegmentum. CT angiogram followed by conventional angiogram confirmed the BAO. Using angiography, the neurosurgeon (JJS) infused 10 mg of IA-tPA directly into the proximal basilar artery, lysing the clot (Fig. 1). The patient's sensory and eye movement exam normalized 18 hours after lysis.

Mortality of untreated BAO approaches 90%. Successful recanalization improves neurological outcomes.¹ In patients presenting more than 3 hours after symptom onset, IA-tPA is the primary, lifesaving treatment.²

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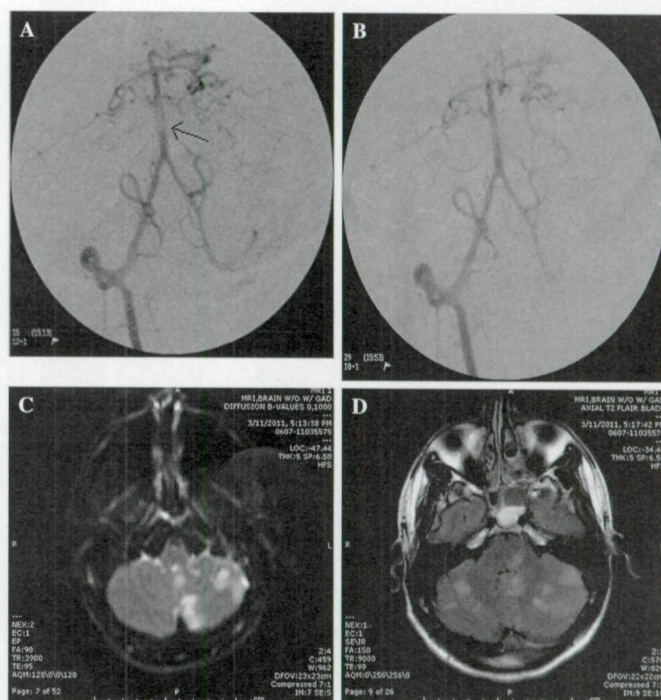


FIGURE 1. (A) Pretreatment conventional angiogram showing the presence of a large clot within the proximal basilar artery (arrow). (B) Angiogram, immediately post IA-tPA with recanalization of the basilar artery. (C) Axial magnetic resonance diffusion weighted imaging done 24 hours post procedure showing patches of restricted diffusion throughout the posterior fossa. Apparent diffusion coefficient mapping (not shown) demonstrated correlating dark areas consistent with acute ischemia. (D) Axial fluid attenuated inversion recovery magnetic resonance sequences show more diffuse left greater than right lesions prominently in the left pontine tegmentum and cerebellum consistent with ischemia.

Early and rapid evacuation to stateside hospitals is a tenet of combat trauma care; however, in 10 years of combat medicine, deployed medical and surgical specialists have broadened the treatment options available to soldiers before stateside evacuation for life threatening medical conditions such as stroke and myocardial infarction. This is most relevant when early interventions can improve outcomes. With

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the paradigm of providing the right care at the right time, emergency stroke care has a limited treatment window before clinical outcomes are irreversible. Our case demonstrates this evolution of modern combat medicine. In a modern combat hospital, clinical outcomes of critically ill nontrauma patients will continue to match U.S. civilian standards with well-trained medics who recognize life threatening medical conditions, a rapid, sophisticated air evacuation

system, and military specialists with current therapies and equipment to treat these illnesses.

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